

# *APPLIANCE FOR THE PREPARATION OF HOT DRINKS*

## 5 **BACKGROUND OF THE INVENTION**

The invention relates to an appliance for the preparation of hot drinks, soups and similar nutritional/semi-luxury foods, with a drinking cup and with a closable container, to be inserted in the latter and provided with an electrical heating device, for the liquid to be heated which, after heating, is emptied into  
10 the drinking cup after a valve of a container has been opened.

In a known appliance of this type (EP 1 118 298 A1), the container is inserted into a drinking cup and filled with water, and the latter is then heated with the aid of the electrical heating device. When the water has reached the necessary temperature, the container is partially lifted out of the drinking cup,  
15 so that the valve opens and the water passes into the drinking cup, where it dissolves the brewing substance previously introduced there. When all the water has passed out of the container into the drinking cup, the container can be lifted off, so that the drink can be tasted.

Appliances of this type are used, in particular, in motor vehicles, in  
20 which there is possibly not the necessary close attention given to operating them. This may lead to scalding or to the spillage of water.

When the container to be filled with water is held in the hand, the valve is opened, so that water poured in at the top runs out again at the bottom. If the heating container has in the meantime been deposited in another cup, but  
25 only to an extent such that the valve remains open, the heating container cannot fill up, since the water runs out again at the bottom until it overflows and runs out of the lower container. However, if the heating container has been correctly inserted and filled with water, so that no water has run out, there is the risk that the heating would be switched on at this moment. If the  
30 heating container is then lifted out of the cup in order to insert it into the cup containing the brewing substance, the water runs out at the bottom and may again cause scalding. Many different mishandling actions are therefore

possible, which in a lesser case may lead to the spillage of water, but in a worse case may lead to serious scalding.

It is also known to provide a valve at the bottom of the container in which the water is heated, the said valve then opening when the excess pressure is generated as a result of heating (US 5,287,796).

It is known, further, to fill a container with hot liquid, the container then opening when it is placed onto a drinking vessel, in that the edge of the drinking vessel acts on a spring-back circular valve actuation element (US 6,327,965 B1).

The object of the invention is to provide an appliance of the type mentioned in the introduction, in which the valve is constructed more simply and the appliance can be used in a more versatile way.

#### ***SUMMARY OF THE INVENTION***

In the solution according to the invention, the valve is designed to co-operate with an axially extending middle projection in the drinking cup for opening the valve when the container is inserted into the drinking cup, and the projection is arranged on a disc-shaped element which is provided with perforations and which can be inserted into the drinking cup at a distance from the bottom of the latter.

The object of the invention is to provide an appliance of the type mentioned in the introduction, which can be operated more simply and more reliably.

In the solution according to the invention, the valve is designed to co-operate with devices, arranged in the drinking cup, for opening the valve when the container is inserted into the drinking cup.

The container in which the liquid is to be heated may, for example, be held in the hand when it is being filled. The valve remains closed, so that no liquid can emerge. However, the container may also be inserted into a vessel and remain there, possibly even for a lengthy period of time, until it is required. Its outside is thereby protected against soiling. This presents no problems in motor vehicles, since, normally, cup holders are arranged in pairs or at least two cup holders are arranged in some proximity to one another. In

this state, the container may also be filled with liquid, that is to say, normally, water.

If a hot drink is to be prepared, the heating is switched on, the container preferably still being located in the other vessel. When the brewing  
5 temperature is reached, the container, together with the heated liquid, is inserted into the actual drinking cup, the valve then being opened during insertion, so that the hot water can pass downwards into the drinking cup, where the brewing substance has previously been introduced. When the heating container is emptied, it can be taken out of the drinking cup and, for  
10 example, inserted again into the other vessel, for example a cup, which is not provided with corresponding devices for opening the valve, until the heating container is required again.

The mishandling actions mentioned in the introduction with regard to the appliance of the prior art therefore cannot occur. It is possible simply for  
15 liquid to emerge from the heating container when the latter is inserted into the drinking cup.

The projection is arranged on a disc-shaped element which is provided with perforations and which can be inserted into the drinking cup at a distance from the bottom of the latter. The disc-shaped element may in this case be  
20 designed as a slosh-over safeguard. To be precise, when the container in which the water has been heated is lifted out of the drinking cup again, the disc-shaped element is arranged above the surface of the prepared drink, with perforations which sharply brake or damp the movements of the liquid in such a way that the liquid can no longer slosh over. The disc-shaped element can  
25 then be taken out in order to taste the drink or else may also remain there, in order to avoid sloshing over even when the prepared drink is being tasted.

The container for the liquid to be heated is closeable, as mentioned, in order to avoid a spillage or sloshing over of the liquid. It has proved particularly expedient, here, if the container for the liquid to be heated is  
30 provided with a swing-open lid. This can be opened quickly and a large orifice is available in order to introduce liquid.

It has proved particularly advantageous if the lid can be locked in the closed position by means of a slide or a pivotable disc. Thus, when the container is filled, the closed lid is secured by means of the slide or the disc,

so that the lid cannot open by mistake or in the event of an accident, even if it falls out of the holding device, which would mean the risk of the spillage of water or, in the case of hot water, even the risk of scalding.

Expediently, in this case, the slide or the disc is designed as a switch for the heating device, actuates a switch for the heating device or makes a switch for the heating device accessible only when the lid is interlocked. In this case, it is possible to ensure that the heating device is actuated or can be actuated only when the lid is closed. The risk of mishandling actions is thereby further reduced.

### ***BRIEF DESCRIPTION OF THE DRAWINGS***

The invention is described below by means of advantageous embodiments, with reference to the accompanying drawings in which:

- |    |               |   |
|----|---------------|---|
| 15 | Figure 1      | shows, partially in section, a container for liquid to be heated;   |
|    | Figure 2      | shows, in section, a drinking cup with inserted slosh-over protection;  |
|    | Figure 3      | shows the slosh-over protection of Figure 2, seen from above;   |
| 20 | Figure 4      | shows an illustration after the heating of the water, after the container together with the heated water is inserted into the drinking cup; |
|    | Figure 5      | shows another embodiment of the container of Figure 1;  |
| 25 | Figure 6      | shows another embodiment of the drinking cup with the slosh-over protection of Figure 2;  |
|    | Figure 7      | shows the container of Figure 5, which is inserted into the drinking cup of Figure 6;   |
| 30 | Figures 8-10  | show details of the lid by means of which the container can be closed;  |
|    | Figures 11-12 | show views of the lid of Figures 8-10 before and after interlocking by means of a slide; and  |
|    | Figures 13-14 | show an embodiment with a pivotable disc in views similar to those of Figures 11 and 12.  |

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Figure 1 shows a container 1, in which liquid, in particular water 2, can be heated by means of a heating coil 3. The cup 1 is in this case inserted into a vessel 4 which may be in the form of a drinking cup. The container 1 has an upper cover 5 with a flap 6 which is mounted pivotably at 7 and can be closed by means of a slide 8. A switch, by means of which the heating coil can be switched on and off, is arranged at 9. In the bottom of the container 1 is arranged a valve which has a valve plate 10 with a conical middle part and a rubber seal 11 arranged on the circumference. The latter closes orifices 12 in the illustration shown in Figure 1. The valve plate 11 is connected to a tappet 13. By means of a compression spring 14, this tappet 13 is pressed downwards and consequently presses the valve into the closed position.

The drinking cup 15 shown in Figure 2 has on its circumference a shoulder 16 onto which is placed a disc-shaped element 17 having a middle elevation 18. The disc-shaped element 17 is constructed from concentric elements 19 which are held together by means of radial webs 20. Moreover, the disc-shaped element 17 has a tab 21, by means of which it can be lifted out of the cup 15. The disc-shaped element 17 is shown from above in Figure 3.

When the water 2 in the container 1 is heated, then, the container 1 of Figure 1 is inserted into the cup 15 of Figure 2, into which a brewing substance 22 has previously been introduced. As shown in Figure 4, in this case the projection 18 presses the tappet 13 upwards counter to the force of the spring 14, so that the valve plate 10, together with the seals 11, moves upwards and the water 2 can pass downwards through the orifices 12 and the orifices of the disc-shaped element 17 and dissolves the brewing substance 22.

Subsequently, the container 1 can be lifted out of the cup 15, so that, if appropriate, after the removal of the disc-shaped element 17, the prepared drink can be tasted.

The embodiments of Figures 5 to 7 correspond essentially to those of Figures 1 to 4, the difference being that the middle projection 18 of the disc-shaped element 17 is larger and co-operates with a larger tappet 13.

Moreover, the valve plate 10 is designed essentially conically and carries an O-ring seal 11 at its edge.

5 The form of the drinking cups may be varied widely. Reusable drinking cups or disposable drinking cups may be used. It is critical merely that a disc-shaped element 17 having a projection 18 can be inserted.

10 The upper cover 5 is explained in more detail in Figures 8 to 10. The cover 5 has a flap 6 which can be pivoted about a joint 7. The flap 6 is shown in the open position in Figure 8 and in the closed position in Figure 9. The lid 5 has located on it, further, a slide 8 with a handle 23, the said slide being displaced to the right in Figure 9, as compared with the position of Figure 8, and thus interlocking the flap 6. A switch 9, which is concealed in the position of Figure 8, is thereby exposed at the same time. As a result, either the current is set automatically or the possibilities afforded of actuating the switch 9 so that the current can be switched on.

15 Figure 10 shows, in section, the position of the parts of Figure 9, also showing a light-emitting diode 24, by means of which the switched-on state of the heating device can be signalled.

20 Figures 11 and 12 show the cover 5 from above, the flap 6 still being capable of being opened in the illustration of Figure 11, whereas it is interlocked in the position of the slide 8 of Figure 12, in order to prevent sloshing over or leakage. Further safety measures are the run-dry protection 25 and a temperature switch 26 which are shown in Figure 10. In a further safety feature, if the operator lifts the container out of the cup before the hot water has run into the cup completely, the valve 10 closes immediately, so that, to that extent, too, the risk of scalding is ruled out.

25 The embodiment shown in Figures 13 and 14 has, for interlocking the lid 6, a pivotable disc 27 instead of a slide 8.